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Technology News & Innovation in K-12 Education

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STEM PD for K-8 gets a boost

Program improves teacher confidence

Engineering is an ideal STEM subject for younger students.

By Stephen Noonoo
Editor, @stephenoonoo

Despite renewed interest, calls for funding, and presidential appeals, true STEM integration is missing from a large number of classrooms across the country. And to hear Patty Born-Selly tell it, that's especially true at the elementary level. "Most elementary teachers when they are placed in the classroom often just don't feel comfortable teaching STEM subjects," said Born-Selly, who is the executive director of the National Center for STEM Elementary Education, an organization embedded within Minnesota's St. Catherine's

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How safe is my student data?

By Jared Prolo

A few years ago I was attending a meeting at my county office, where a vendor who runs a popular education site was making a presentation. If I'm being honest, I'll admit I wasn't paying close attention. It was a product our district was already using, and I was our top level administrator for my district's

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Blended learning sees success

A new push in D.C. has big ambitions

By Lucille Renwick

For the past two years, the Washington, D.C., Public School District (DCPS) has earned a sort of celebrity status with lawmakers, superintendents, and think tank heads filing in to see what, and especially how, students are learning. They have a good reason to visit. In a district that has been plagued with

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Creating PLCs teachers want to use

By Michelle Eaton

At my district, the MSD of Wayne Township in Indianapolis, we have found that changing the way we think about teacher training not only benefits staff developers and administrators, but schools, the district as a whole, teachers, and ultimately students. A critical part of our revitalized professional development plan has been the use of professional learning communities (PLCs), which are essentially groups of educators who work collaboratively and share ideas, often in an online format.

From our experience, here are seven suggestions for developing PLCs that work.

PLCs offer educators a chance to use flipped learning, too.

1. Create an online environment

Our PLCs use the same learning management system that we use with students. This provides two key benefits. First, it is an easy way to model good online and blended learning. Our teachers have shared on several occasions that participating in an online community helps them better understand how they could create similar environments for their students. Second, many LMSs provide tools that make communication, sharing, and collaboration successful for groups of learners.

2. Use it for informal learning

After creating the online space, your online community can be used for lots of different types of professional development. It is a wonderful place for informal learning to happen. Teachers can share ideas, post questions, and collaborate through this online environment in many of the same ways that they might share through social networks.

3. Try structured opportunities, too

Structuring opportunities for peer support in an online format has been successful in our district. For example, at one of our high schools, teachers self-select to participate in blended professional development courses called "Innovation Centers" led by their peers. While they have scheduled face-to-face learning time, the teachers leading each course create a space for online work and learning as well. Additionally, our lead technology teachers in all of our buildings collaborate in a PLC with study groups on self-selected topics of interest.

4. Flip the model

PLCs also provide a space and opportunities for professional developers to "flip" their PD. In the same way that you might flip your class, staff developers and administrators can provide the direct instruction they are planning in a digital format beforehand and save the limited face-to-face time for true collaboration and planning.

5. Let teachers go at their own pace

At our virtual high school, Achieve Virtual Education Academy, many of the professional development meetings are led completely online in the form of learning modules. Teachers will work at their own pace throughout a given time frame on collaborative and engaging online activities. These learning modules are then available at any time should a teacher need to reference them later. Our teachers have responded positively to this, because it gives them the freedom to learn at a speed comfortable for them while also modeling quality online learning techniques.

6. Build in time for learning

It is important to build in time for this type of learning. This should not be simply added on top of everything else on a teacher's busy schedule. PLCs are much more likely to be successful if the time is given to truly participate.

7. Go slow; it's not a race

Keep in mind that an environment and culture of sharing and collaboration is not developed overnight. I remember months of encouraging teachers to share ideas and questions publicly after they would ask me a question or share a resource with me. After several months of modeling and guiding these activities, the sharing began to happen more frequently and organically. Now, I help facilitate several groups that are truly active, collaborative learning spaces. eSN

Michele Eaton is the Virtual Education Specialist for the MSD of Wayne Township in Indianapolis, Indiana.

This piece is adapted from a new monthly column from the International Society of Technology in Education appearing the third Monday of each month on eSchoolNews.com.

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Technology integration starts with learning goals


Tom Daccord

The other day I was working with a group of elementary school teachers on lesson planning with technology. They were introducing some new vocabulary words to their fourth-grade students and they were looking for some ideas. As we began, they said very little and it was clear were expecting me to introduce some new tools and apps that they might adopt in their classrooms.

Instead, I asked them a question: How can you be sure that students understand the vocabulary? For the next several minutes, we discussed ways in which the teachers would be certain that students knew and understood the new vocabulary words. One of the teachers offered that if the students really understood a vocabulary word they would be able to find and identify a relevant and appropriate picture depicting the word.

Another mentioned that if the students understood the vocabulary word they would be able to identify a recorded description of the word amongst recordings of other words. So, we began our technology integration process by envisioning learning activities that would demonstrate student mastery of curriculum content.

We did not begin with an introduction of tools, but rather we identified learning goals appropriate to the curriculum content. With learning goals in mind, we then started to craft a lesson plan for learning the new vocabulary. One suggestion I offered was for the students to search online to find an appropriate picture depicting a particular vocabulary word and to place their picture up on the classroom wall. Students would also record a description of their particular word for other students to identify.

Thus, the lesson might involve tacking up unidentified pictures of all the vocabulary words on the wall and having students attempt to identify them by listening to vocabulary descriptions recorded by classmates. Teachers could number the pictures on the wall and provide students with a document containing the numbers and a link to all the descriptions. The challenge for students would be to place the correct number beside the description of the word.

We then turned to a discussion of tools that could support us in creating an ideal learning environment for acquiring and understanding vocabulary. I brought them to Vocaroo, a free and easy online recorder, which allows computer users to record themselves and share the recording with others. (An app equivalent for the iPad is Recorder HD.) We discussed how we might accumulate and distribute all the recordings by putting links to them on a collaborative Google Doc. We discussed a few other logistical points and proceeded to finalize a lesson.

The process of identifying learning activities that would prove the students understood the vocabulary words was not an easy task for the teachers. But if we had not begun with a discussion of learning goals, we would have likely focused on tools and done so without a clear sense of purpose for using them.

The real challenge of integrating technology effectively is not the technology. It's developing a vision for technology use. In this case, the teachers were able to create audio recordings with Vocaroo in a matter of minutes. They were also able to create and share a collaborative Google Doc relatively quickly. But they struggled with envisioning ideal learning environments for demonstrating mastery of vocabulary. But once they had a vision in mind, they were able to use tools directly in the support of a clear learning goal.

Not all tools are as easy as Vocaroo.com, and teachers certainly need to spend some time learning how particular web tools and apps function. But in the world of ed tech today, far too much time is spent on discussing tools and their features and not enough on learning. It's like the ship without a compass that meanders aimlessly across the sea. If you don't know where you're going, how do you know you've arrived?

So let's spend more time in discussion with teachers about their learning goals and how students will demonstrate their knowledge of curriculum content. Let's develop a vision of what students should be able to do and how we will help them get there. Let's use technology continually in ways that are thoughtful and directly in the service of learning. eSN

In the world of ed tech today, far too much time is spent on discussing tools and their features and not enough on learning. It's like the ship without a compass that meanders aimlessly across the sea. If you don't know where you're going, how do you know you've arrived?

Tom Daccord is the director of EdTechTeacher (http://edtechteacher.org), a professional learning organization.

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The 7 fundamentals of blended learning PD

Experience has shown that blended learning is not intuitive for many teachers. Yet blended learning programs are the natural consequence of technology-enhanced education.


Peter West

Thus, educational organizations must provide professional development across a range of key areas for a significant period of time to increase the chances of success with blended learning initiatives and effectiveness among instructors.

The areas of knowledge that must be developed by teachers in the drive to blended learning are not necessarily sequential. However, some stages build upon the foundations provided by a previous level.

Just as a musician must already know how to read music, play chords, and understand their instrument before joining an orchestra, a teacher must be knowledgeable about and comfortable with the fundamentals before the symphony that is effective blended learning can reach its full potential.

Some fundamentals are:

1. Effectively using the computer/laptop/operating system /network/internet. This stage is really about computer, network, and internet fundamentals. It requires the ability to comfortably operate one of the main tools required to facilitate blended learning.

2. Effectively using the core software. No matter how many apps or web 2.0 resources are used, the fundamental software of word processors, presentation software, and the like is still an essential part of most learning environments.

3. Understanding the Learning Management System/online learning environment (OLE). This requires a knowledge and understanding of the concepts, features, and benefits of the OLE.

It requires an understanding that effective blended learning goes beyond simply delivering learning resources. If this were all that was required, a file repository or basic website would suffice. An effective OLE goes well beyond content delivery to include quizzes, forums, assignment submission, assessments, and much more, and allows students (and optionally, parents) to view feedback and grades instantly and easily. A good OLE will also go beyond this to provide analytics to support teacher intuition and facilitate early intervention if necessary.

> *No matter how many apps or web 2.0 resources are used, the fundamental software of word processors, presentation software, and the like is still an essential part of most learning environments.*

4. Understanding the attributes of learning resources as compared to teaching resources. An understanding of the differences is essential. Blended learning focuses on learning rather than teaching, and learning resources can be different from teaching resources. Teachers should know the differences.

5. Knowing how to build content effectively. There is much more to building effective blended-learning courses than simply placing a range of worksheets, presentations, and videos into an OLE. It requires an understanding of basic principles of effective online learning and how it differs from traditional teacher-centered direct instruction. It requires knowledge of how to integrate learning within an OLE, and how to build effective resources when necessary using learner centric tools.

6. Understanding a range of blended-learning models. This is essential so that informed decisions can be made about effective pedagogy.

7. Adjusting/fine-tuning the blended-learning models and material to suit the discipline and faculty.

While disciplines such as science, mathematics, music, and physical education share many pedagogical principles, they also have differences. Appropriate blended-learning models need to be selected to suit the particular academic discipline. These models then need to be fine tuned, which impacts the courses developed to support the models. This is a complex process that requires knowledge of and familiarity and confidence with a wide range of skills.

I have seen teachers at all stages of this continuum of understanding; teachers comfortable with all of the skills cope very well and create effective blended-learning courses relatively easily. However, experience has shown that teachers who have less understanding of the areas outlined typically feel more stressed, more fatigued by change, and develop blended-learning courses less efficiently and effectively.

While it is difficult in some organizations to determine where individuals are on this continuum, leaders of learning organizations need to be aware of the seven areas of understanding required for successful blended learning to occur, and then need to facilitate effective and targeted professional development for teachers. eSN

Peter West is director of E-learning at Saint Stephen's College in Australia.

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University (colloquially known as St. Kate's).

"They might avoid it or they might teach the bare minimum or they might go on a field trip and think that was their science lesson," she continued. "But what we've found across the board is that teachers really want to be more comfortable with this material."

Why the disconnect? Limited exposure to teaching STEM during college and pre-service training leads many elementary teachers to soft peddle those subjects in their classrooms, she said. Students, in turn, feel detached from science and math, which may dissuade them from pursuing STEM subjects at higher levels later on.

That's what Born-Selly's organization, the NCSEE, hopes to prevent. The NCSEE began as a way to strengthen the hard science training among students of the school's college of education. Later, St. Kate's added support staff for an on-site STEM professional development program, which offers everything from daylong workshops to intensive week-long courses with periodic follow-ups for K-12 schools and districts across the country.

The goal of this targeted STEM-focused PD is to plug a gap that currently exists in elementary education—to help better integrate STEM into the school day, rather than allocating a chunk of time for science and another for math. "Given that you have one teacher in one classroom in elementary schools, it makes sense to be thinking about things in a holistic, integrated way," Born-Selly said.

"Research shows that children make decisions very early on in their elementary lives about whether or not they like science or math and that can be influenced by their teacher's likes and dislikes," said Vicky Yatzus, head of school at the Independence School, a tuition-based academy in Delaware.

To help break that cycle, Yatzus' school decided to partner with St. Kate's, after connecting at a science education conference, for a comprehensive PD regimen they knew would take teachers out of their comfort zones and, hopefully, invest them with more confidence in their classrooms.

Eliminating the fear factor

St. Kate's teaches courses on a variety of STEM-related subjects tailored specifically for K-8, including standby STEM subjects, such as chemistry and biology, and fun, kid-friendly fare, such as citizen science and learning outdoors. But Independence knew exactly where it wanted to start: The subject their teachers knew the least about.

"Most—virtually all—elementary school teachers have had no training in engineering. That's almost unheard of until very recently, and it's still pretty unusual," said Bernadette Gilmore, who serves as director of academics and curriculum at Independence. "It's a place where we had a void of knowledge."

A teacher in training gets hands-on.

In that regard, Independence is far from alone. Minnesota recently added new engineering concepts to its state standards, Born-Selly said, and she's seen a general surge of interest in related courses across the board. "There's been a lot of interest among educators on wanting to know, 'How do I teach engineering? Is it just looking at bridges or is it more than that, and why is it more than that?'" she said. "Engineering seems so clearly to lend itself to hands-on activities and experiments, and building and trying again and reworking."

Independence began with a week-long crash course in teaching engineering to elementary school students, taught by an engineer and an education professor from St. Kate's. Teachers learned about engineering concepts in general and also participated in mock lessons that mirrored what their students would be doing.

"I think it took away the fear factor," said Gilmore, who adds that some teachers may have been intimidated by the idea of having to attend engineering training. "But the thing about engineering is you're problem solving. You're trying to design a solution for some type of problem. And failure is going to happen. They talked about failure not being failure but just your first prototype."

Following the weeklong training, the school followed up with five more coaching sessions given periodically throughout the year. In those, teachers began deconstructing their knowledge and designing new lessons that fit seamlessly with their curriculum. "As we got into it, and as teachers began grabbing hold of it and designing lessons, that's when we really got very specific about what we were looking for," Gilmore said. "If we had ideas, they helped us improve them and home-in on quality lessons."

A logical sequence

Closer to home for St. Kate's, Stillwater Area Public Schools, a district serving about 9,000 students outside St. Paul, also had the idea to beef up its elementary science curriculum, but, ever mindful of tight budgets, it wasn't on the table. Then, a local business generously offered to subsidize teacher training relating to science. Denise Cote, the district's curriculum coordinator, jumped at the chance and immediately gathered a cohort of 20 elementary science teachers who would complete not one but three different courses (in biology, chemistry, and engineering) over the course of a year, taking some workshops over the

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summer and others on weekends. At the end of the third course, teachers received an elementary STEM certification from St. Kate's.

If Stillwater teachers felt intimidated, though, they at least seemed equal to the challenge. "It was really easy to fill the spots," she said.

That isn't to say teachers didn't have their share of concerns. There was the natural fear of teaching engineering and some questioned how topics most people recall from high school would scale all the way down to kindergarten. Much of that was addressed throughout the courses, Cote said, as teachers learned tips and practicalities, such as holding their hands out in front of them to demonstrate a two-foot span, which could be passed on to students.

Having an education expert present certainly helped, she said, as did a series of sessions held after each course, where teachers unpacked what they had learned and wrote either a unit or a handful of lessons. "Then, as a large group we talked about it, so that there was a logical sequence and so that students are learning and building on what they've learned year-to-year," she said.

Later, those lessons were compiled into grade-level binders, which were presented to the entire district faculty. "The teachers from each of the grade levels that were in the STEM cohort would show the other teachers, 'This is what we developed, this is why we did it, here's how you can incorporate it into the science you're already doing.' That's how we rolled it out to the rest of the staff."

Shift in perceptions

As part of the grant Independence received for the training, data was collected and analyzed on student and teacher attitudes toward engineering. "Basically, after one year, there was dramatic change and shift in the teachers' perceptions," said Yatzus. "Just in feeling much more comfortable and much more knowledgeable to teach classes that contained engineering pieces."

Teaching practice, too, has changed, Yatzus said. "They're taking a math concept that could be typically in a textbook or on board and then saying 'OK, how else could we solve this problem by using things around us and getting kids actively involved?' And we know that our students learn so much better when there's that hands-on active involvement."

Since the training, Cote's teachers have also expressed more confidence in the way they teach STEM. ("I'm definitely teaching science differently, with more thought as to the process of teaching and not the product," one teacher wrote on a feedback form). Cote has also received another small grant from the same local business to purchase tubs of supplies for each school site, so teachers can replicate the activities from the training and lessons in the binders. Overall, she said, it's breathed new life into the curriculum on the whole.

"I think a big thing that's changed for a lot of teachers is really seeing the tie-in that we don't have to teach these different content areas in silos," Cote said. "Integrating different things into lessons and making it more like real life for kids is motivating for them, and it's a very efficient and effective way to teach." eSN

10 steps to a STEM school

1. KNOW YOUR OWN EXPERTISE. What are your strengths? Capitalize on your current areas of strength and build from there.

2. NAME YOUR GOALS. Why do you want to be a STEM school? What will students walk out of your school knowing how to do and understand?

3. IDENTIFY YOUR PHYSICAL RESOURCES. Do you have a computer lab shared by the whole school, or tablets for each student? Is your school located near a natural area that could serve as an outdoor classroom?

4. IDENTIFY YOUR HUMAN RESOURCES. Who are the experts you may reach out to? What funding do you have available? What are the parents in your school community willing to do to support you?

5. KNOW THAT STEM IS A SPECTRUM. Start with reasonable, measurable outcomes. Define a series of steps you can take to reach your desired level of STEM integration.

6. PLAN FOR THE NEXT LEVEL. Be constantly thinking about new ways to grow, deepen, and integrate STEM so that your students have every advantage in the future.

7. ENGAGE YOUR COMMUNITY IN THE PROCESS. Hold science expos, engineering nights, technology challenges, and math activity days for the parents and other community members.

8. LEVERAGE PROFESSIONAL CONNECTIONS. See if you, your staff, or anyone from your school community has a connection (or can make one) with a STEM professional society.

9. OBTAIN PROFESSIONAL DEVELOPMENT. Have a plan for continuous PD. Consider how to integrate STEM across content areas.

10. BASK IN YOUR STUDENTS' SUCCESS. Have yearly events where faculty, staff, and students can celebrate their learning and accomplishments in STEM over the year. (Source: National STEM Center for Elementary Education; http://stem.stkate.edu)

The Japanese presentation style changing everything about PowerPoint

Pecha Kucha combines lots of slides, a quick pace, and deeper knowledge

By Ivy Nelson

"Students, please remember to monotonously read every slide word-for-word when you present to the class," said no teacher ever.

My performance arts background as an actress, director, and theater teacher gives me a great understanding of what it takes to be a dynamic performer, and an even greater appreciation of a great performance. Knowing this, it comes as no surprise that after several years of teaching high school theater and English, I became utterly dejected by the quality of presentations my students gave.

It wasn't their fault; my students simply had never been taught how to present information in a way that was engaging and interesting. In fact, many adults struggle with this same task. We have all seen so many bad presentations in our lives, we have come to think that's what presentations are supposed to be like. My students honestly thought the act of giving a presentation meant looking something up on Google, copy/pasting some information into PowerPoint slides, and then getting in front of the class and timidly reading those slides verbatim to a disinterested and disengaged audience (myself included).

I had to stop the madness!

Around this same time, a teacher colleague of mine introduced me to Pecha Kucha. My first question was "What's Pecha Kucha?" The short answer is it's a great presentation style that gets students thinking and learning, not reading slides. A longer one might be to explain that the term comes from the Japanese words for "chit chat," so as you might guess this unique presentational style embraces a more conversational tone. But more importantly, it is transforming presentations as we know them.

I was very intrigued by this presentation style, as it relies on visual images instead of slides crammed with a thousand bullet points and so much information it will only fit on the screen in six-point font. I also liked the fact that Pecha Kucha forces the presenter to actually know what they are talking about and puts a conversational ("chit-chat-y" if you will) tone in their presentation.

I had to try it immediately with my sophomores. They of course hated me for this. "We can't read from the slides?" they exclaimed. I apologized for trying to ruin their lives and being the worst teacher ever.

Pecha Kucha is 20 slides, 7 minutes.

This did, however, make me reconsider my initial plan. A presentation in the true style of Pecha Kucha is 20×20: 20 images displayed for 20 seconds each. The presentation is timed so that it advances on its own, and the speaker talks along with it, making the presentation six minutes and 40 seconds exactly. My students' protests helped me realize that I needed to ease them into this, and help them break the bad presentation habits that they had developed over time gradually, instead of cold turkey.

I decided that for their first Pecha Kucha presentation, they would be allowed to have no more than three pieces of information on each slide, but they had to include a picture that encapsulated the gist of that slide's information. I decided to keep the 20×20 format for a 6:40 presentation, but allowed my students to work with a partner this first time to share the responsibility of presenting.

I was pleasantly surprised at how well my students did with this first go-round of Pecha Kucha, and they were too! For the next presentation I assigned students, they were required to have only images on their slides, but they could use speaking notes during the presentation. Eventually, all of my students were presenting in true Pecha Kucha style. Some ran with it and excelled, others plugged along, and some begrudgingly suffered through it. In time, though, their presentations improved, and their learning also increased. I didn't see any more slides with information copied directly from a website; my students were finally researching their topic, synthesizing the information, and presenting it in a way that showed me they actually understood the subject matter.

I joked earlier about being the "worst teacher ever" because I wanted to challenge my students to improve, and you probably will have students who will give you a hard time for pushing them. Stick with it. Celebrate the small successes you see and trust that, with time and practice, your students will only get better. eSN

Ivy Nelson is the technology integration specialist for the Harrisonville R-9 School District in Harrisonville, Mo. She previously taught at Monett High School in Monett, Mo.

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[1]PBS Learning Media Survey, pbs.org, Feb. 2013 [2]Pew Internet, *How Teachers Are Using Technology at Home and in Their Classrooms*, pewinternet.org, 2013
[3]Washington Post, *Getting Schools Up To 21st Century Speed*, washingtonpost.com, 2013

Oxford Virtual Academy Expands Students' Opportunities with Help from Middlebury Interactive Languages

Award-winning online world language curriculum 'opens up avenues that students never would have had before'

To give students more learning opportunities that they otherwise wouldn't have, the Oxford Community Schools in Michigan operate a highly regarded virtual academy that attracts students from around the state.

These opportunities include the chance to take world languages such as French, German, Spanish, and Chinese through a partnership with Middlebury Interactive Languages—and it's a benefit that has brought more students into the program, including homeschooled children who want to learn another language, said Andrew Hulbert, executive director of virtual learning.

The Middlebury Interactive Languages curriculum "gives us the ability to offer world languages that we couldn't offer in a brick-and-mortar environment," Hulbert said, citing financial and resource challenges of providing face-to-face world language instruction. "It has opened up avenues that students never would have had before."

Established five years ago, the Oxford Virtual Academy serves about 1,200 students, many of whom come from outside Oxford. The academy is open to students in kindergarten through 12th grade, and it offers an early college program that provides college credit as well.

"With Middlebury Interactive, the students come out ahead in their ability to speak the language—which is not always the case with other world language vendors."

—Andrew Hulbert, executive director of virtual learning, Oxford Virtual Academy

"We have kids learning a world language as early as the third grade," Hulbert said.

Some of the academy's participants are full-time virtual students who log in from home, while others supplement the traditional instruction they get in the Oxford schools with online classes not offered at their school. Those students can log in to their online classes from computer labs located in Oxford's middle school and high school, Hulbert said.

"We've given those spaces sort of a coffee shop feel, and they're open before school and after school, as well as during the school day," he said. The labs contain computers, headphones, and "everything else that students would need to be successful."

Honored in the Readers' Choice Awards program from eSchool Media for the last two years, Middlebury Interactive's online language curriculum is based on principles of the language pedagogy utilized at Middlebury College's renowned Language Schools.

The courses were developed for K-12 students by Ph.D.-level academics and linguistic experts, using approaches proven to be effective in language instruction. For instance, video recordings of actual interactions between native speakers in different countries bring cultural authenticity to the lessons.

"We've built language learning activities around these videos, as well as authentic written resources such as newspapers," said Aline Germain-Rutherford, chief learning officer for Middlebury Interactive Languages and Surdna Professor of Linguistics at Middlebury College. The use of authentic materials helps students learn not just the language, but also the culture.

Hulbert said he was drawn to the Middlebury Interactive curriculum because it provided a much richer understanding of the languages than other products he tried. "It gives kids a deeper, more immersive opportunity to speak the language, rather than just understand the language," he said, noting that it offers instruction ranging from introductory to highly advanced, with fully native speakers.

One of the challenges for students who are learning a language online is the ability to engage in conversation. Middlebury Interactive Languages solves this challenge by including the opportunity to have synchronous conversations with live instructors.

"Students actually have to speak to the teachers, and the teachers will reply," Hulbert said. "There are three components of the instruction—reading, writing, and speaking—and they really address all three. With Middlebury Interactive, the students come out ahead in their ability to speak the language—which is not always the case with other world language vendors."

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- Align with Common Core and WIDA standards.

Can self-provisioning your district's internet save you money?

Districts that self-provision internet can get fast broadband speeds and save big on monthly costs. So why haven't more districts invested in it?

By Bridget McCrea

In Evan Marwell's estimation, anywhere from 10 to 15 percent of the nation's K-12 school districts have self-provisioned their own fiber networks. In most cases, this CEO of San Francisco-based EducationSuperHighway said these districts opt to self-provision those networks because they can't get internet access any other way.

"These are primarily rural schools that can't get anyone else to bring cyber to them," said Marwell, "and/or that couldn't get a service provider to build a fiber network for them."

Marwell said there are two major components that are needed to gain internet access: the access itself (i.e., the type that comes into either the district office or some other signal point within the district) and wide-area network (WAN) that connects that district office to all of the schools.

According to Marwell, self-provisioning is usually involved only with the latter, with the primary driver being the ability to effectively run "your own little network that connects all of your schools together," he explains. "It costs almost nothing to do this, and you can get as much capacity as you need."

"Upgrading the optical components and upping the network's capacity is incredibly cheap," says Marwell. "All of the money goes into the actual building of the fiber, so when you self-provision you gain a lot of control and [scalability] for a small amount of money."

Shaving the costs

In an effort to save on the cost of self-provisioning, Marwell said schools opt to self-provision only the connection that runs from their district office and out to the service provider. That provider then handles the internet access itself (versus the WAN, which is handled by the school).

And while most schools use self-provisioning because "no one else will build them a fiber network," said Marwell, taking this step also gives districts some control over their own destinies in terms of capacity. "When you build your own fiber network, and once the fiber is in place, upgrading the capacity of that network is incredibly cheap." The district that wants a 100MB network connecting its schools, for example, can purchase the necessary optical components for less than $100. The same components for a 1GB network would cost $300-$400, while 10GB would be somewhere between $1,000 and $1,500.

"Upgrading the optical components and upping the network's capacity is incredibly cheap," said Marwell. "All of the money goes into the actual building of the fiber, so when you self-provision you gain a lot of control and [scalability] for a small amount of money."

Putting those costs into perspective, Marwell said that a 1GB WAN circuit that's run by an outside service provider fetches a national average of about $1,200 per month, while a 10GB circuit is about $4,000 per month. "You can see that you'd be much better off spending a couple of thousand of dollars one time [for the actual self-provisioning work] and getting from 1-10GB," said Marwell, who estimates that ongoing maintenance costs for a self-provisioned network average $100 to $200 per month, "rather than paying thousands per month to a service provider."

What's the holdup?

So the question is, why aren't more K-12 districts and/or schools rolling up their sleeves and getting into the self-provisioned internet business? Funding

has been the primary obstacle up until now, said Marwell. "Most of them couldn't afford to build the fiber," he said. "Mostly it's the wealthier school districts that have undertaken these projects, namely because the fiber networks themselves are expensive to build. Average national costs for such projects are around $50,000 per mile, according to Marwell.

"If you consider the district with even just 10 schools–each of which are about 1.5 miles apart–you're talking about a $750,000 project, give or take," Marwell explains. "That's not an easy number of schools to come up with." In 2015, however, that figure could be within reach for a greater number of schools thanks to recent changes in the E-rate program. "Now when schools can demonstrate that self-provisioning is the most cost-effective option for getting a fiber connection to every school," said Marwell, "they'll be able to get their 'normal' E-rate discounts for the [projects]."

The district that has a 70 percent E-rate discount, for example, would only have to shell out $225,000 for its 10 schools that are 1.5 miles apart from one another. "That represents a massive change in the economics right there," said Marwell.

Financial constraints aside, some schools just aren't interested in laying down new fiber in an area where service providers are already present and offering affable pricing for the access. "Many schools just don't want to have another technical issue to worry about," said Marwell. "Frankly, if your service provider is charging you a reasonable price ($750-$1,000 per month, depending on capacity), we don't recommend you go out and try to build a network anyway."

A bigger bargaining chip

With the revised E-rate funding plan now including self-provisioning as an option, expect to see more schools considering this choice. In the beginning, Marwell anticipates geographically isolated districts to be among the first to take advantage of the new option, although he's also seeing signs of interest from other schools as well.

"Going forward, we'll see more sophisticated districts asking for proposals from service providers while at the same time going out and calculating what it will cost to self-provision," said Marwell. "That, in turn, will become a price-cap regulator and a bargaining chip for the districts when working with service providers." eSN

Bridget McCrea is a contributing writer for eSchool News.

By Jennifer Welch

A digital transformation that starts at home

At Vancouver Public Schools, Steven Webb's community-focused vision guides his district's drive to digital.

Part of Steven Webb's vision includes scaling technology use methodically.

Dr. Steven Webb's rise as a visionary leader in K-12 education is as much a credit to his listening skills as it is to his leadership skills. Before the board of Washington state's Vancouver Public Schools adopted the strategic plan for the district's digital transformation in 2008, they did extensive public outreach to ensure that every community in the district had a chance to be heard. "What's happening at our district isn't my vision," remarked Webb. "It isn't the board's vision. It's the community's vision for their children."

It makes sense. If your district's digital transformation supports a scalable personalized learning initiative, how personalized can it be if it's a top-down, one-size-fits-all plan that doesn't take into account the specific needs of the community? The district collected more than 2,000 separate sets of input from a variety of different engagement strategies, including focus groups with targeted audiences, such as parents and students in unique populations they might not have heard from otherwise. The district did deliberate outreach to low-income and Russian- and Spanish-speaking communities that might not reply to an online survey pushed out to the entire district. They even reached out to local patrons and businesses, community thought leaders, and higher-ed partners. "At the end of this very extensive process, we had a clear and compelling vision for this digital transformation, and community ownership of this vision," explained Webb.

The key priority that came out of the strategic planning process was labeled Time and Space. Technology—specifically mobile devices—played a big part in the vision. "For us, it's about thinking differently about how we leverage and think creatively about how we use time, space, and technology to maximize learning potential and to scale personalized learning with fidelity," said Webb. "It's about finding the best ways to scale mass customization."

Currently, the district is in its third year of scaling its mobile learning initiative. Eleven of the district's 35 sites are completely one-to-one. As an entry point, the district started with several schools of choice—magnet schools and a clutch of middle schools. It has now scaled up to their remaining middle schools and are seeding pilots at one of its 6-12 schools. Next year the initiative will expand to the district's comprehensive high schools and the following year to one of their elementary schools in grade five. Finally, they'll expand to grades four and three together in all elementary schools. It's a methodical rollout designed to ensure that the implementation matches the needs of each student population, with each stage being seeded in a beta environment a year ahead of its full implementation.

Webb stresses that their approach to their digital transformation isn't about the technology, it's fundamentally about transforming the kinds of learning experiences that students have in their classrooms, uniformly. "We deliberately scaled this in a way that focuses on a whole systems approaches to organizational change," explained Webb. "In order to get that second-order transformational change, we're making sure that this is connected to student learning outcomes and instructional quality, and that we have a robust professional development ecosystem in place that supports collegial ongoing job-embedded support in order to equip our teachers with the knowledge, skills, habits, and dispositions to leverage these digital learning resources in transformative ways."

The district began with instructional quality, and then linked it to an instructional framework, which it supports through high-quality professional development. From there, it began scaling the other elements—curating content for teachers, rolling out content and learning management systems. "If you start by just handing out iPads, or laptops, or digital textbooks, the initiative might work in the short term, but you won't be able to scale up to get at mass

customization," Webb said.

The district will scale close to 18,000 devices in grades 3-12 within the next three years; Webb's predecessor had the forethought to install a large pipeline at the district so bandwidth to support that number of devices is not an issue.

When the district scales to a school, it deploys an instructional technology facilitator who works in collaboration with the school to help staff think differently about instructional quality and digital media. "Their job isn't about fixing the technology," explained Webb. "We've got the hardware team and a network team that's responsible for that. Their job is about getting out high-quality instructional transformation and learning outcomes."

> *"For us, it's about thinking differently about how we leverage and think creatively about how we use time, space, and technology to maximize learning potential and to scale personalized learning with fidelity," explains Webb. "It's about finding the best ways to scale mass customization."*

All of these elements were part of the levy request that passed in 2013 and are embedded in that strategic vision developed in 2008. "So everybody had a sense of the vision, that this is a whole system that needs to be in place in order to deliver on this notion of mass customization," explained Webb.

What excites Webb the most about the way in which the district approached its digital transformation is that the initiative has always started and ended with student learning and setting students up for success. "It's about the building knowledge, skills, and habits for our young people to be able to thrive in a global interdependent economy, and to be future-ready, successful graduates of our school system."

In the years since adopting the initiative, Webb has been involved in taking his mass customization model and scaling it beyond the boundaries of his district. The district is an active member of Digital Promise's League of Innovative Schools and is hosting the League's spring meeting. Also, the district was chosen as one of 12 host sites for the White House and the Department of Education's ConnectEd to the Future conference.

"This is fundamentally about leveraging learning across like-minded schools in the nation who want to transform outcomes for kids, close achievement gaps, and accelerate student achievement through the use of digital learning resources that can personalize learning in a way that enables that to happen," said Webb. "Being a part of a professional learning network isn't just about receiving help and ideas and insights, it's also about contributing."

Webb spends a considerable amount of time his district's schools and classrooms, and so he can see first-hand that student engagement is off the charts. As Webb explains, if students are engaged in their learning, they're more likely to demonstrate mastery of standards. And if they're more likely to get at the learning target in a specific lesson, they're more likely to demonstrate competencies on standardized assessments and to develop the capacities that enable them to be future-ready. "These 21st century skills that our students are building are not just about core standards," explained Webb. "It's communication, collaboration, creativity, critical thinking, and citizenship." eSN

Jennifer Welch is a freelance writer based in Brooklyn, N.Y.

Inquiry-Based Research Tool Helps Boost Science—and Reading—Proficiency

At Woodham Middle School in Escambia County, Fla., science enrichment teacher Larry Hanna is using an online curriculum service called *Britannica Pathways: Science* to help struggling students become proficient in science.

In using the Britannica product, Hanna's sixth- through eighth-grade students are learning how the scientific method works—and their reading skills are improving as well.

Woodham Middle School has a very high poverty rate, with nearly 90 percent of students qualifying for federal Title I status. Add in the fact that science often isn't given a high priority in elementary school, and "we have sixth-graders who come in with very little science background," Hanna said.

Two years ago, only 26 percent of Woodham students were considered proficient in science, according to the state's end-of-year science exam. That was the worst result among Escambia County's middle schools—and Hanna was tasked with turning things around.

Students have found Britannica Pathways: Science *to be engaging, and "we have seen a marked improvement in their skills," said science enrichment teacher Larry Hanna.*

Predict. Investigate. Conclude.

Hanna's science enrichment class, taught in the school's computer lab, supplements the teaching that students get in their traditional science classes. The core instructional resource he uses is *Britannica Pathways: Science*, an inquiry-based product that covers Earth, space, life, and physical science topics for middle-school students.

The curriculum is organized into 10 units, and each unit consists of 10 lessons. Every lesson starts with an "essential question" that students must predict an answer to, such as: "Why does the sun appear to rise in the east?"

After students have explained their prediction, they look for evidence using Britannica's safe, curated research tools, such as encyclopedia articles, videos, and images. Hanna asks his students to explore at least five different resources on the topic. Students analyze this information, draw conclusions based on the evidence they find, and write arguments to support their claims.

Predict, investigate, conclude: "That's exactly what scientists do all the time," Hanna said. The process "matches the scientific method," and it develops students' critical thinking skills as well as their knowledge of science.

"A marked improvement"

After the first year of Hanna's science enrichment course, the percentage of Woodham students considered proficient in science rose from 26 percent to 36 percent—and school leaders predict an even bigger leap this year. "Several students missed scoring at a proficient level by just one question," he said.

Hanna has noticed a valuable side effect of using the Britannica product: His students' reading skills also are improving. "They're not used to reading scientific texts," he said, "and of course that's what the encyclopedia articles are."

Britannica Pathways: Science includes a number of reading supports to help students understand scientific language, such as a read-aloud feature and a quick-click dictionary. As the Common Core standards place more emphasis on reading complex nonfiction texts, Woodham students will be well positioned for this increased rigor.

Hanna said he appreciates the high degree of insight the product gives him into his students' work. "All I have to do is click a button that says 'View,' and I can see every answer the students have given," he said. "It gives me a lot of power."

Student engagement is high, he said, "and we have seen a marked improvement in their skills."

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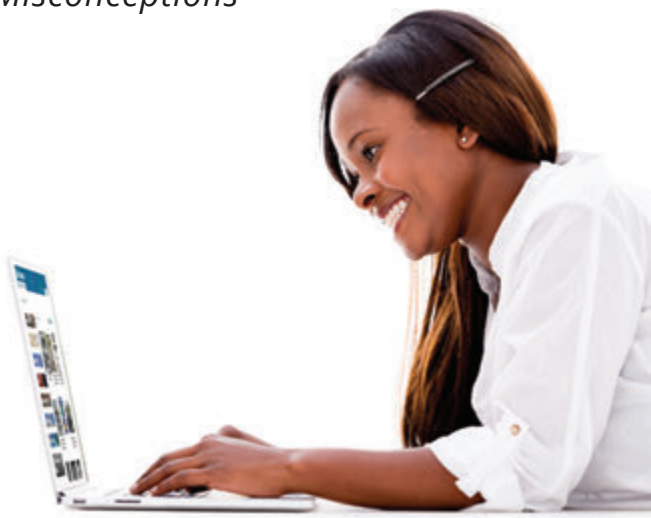

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Transform

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low test scores and student performance, several D.C. schools have seen student proficiency levels jump in math and reading in recent years.

Part of their success has hinged on the way teachers are using blended learning in the classroom.

"Blended learning definitely has been an important factor in the changes we've seen in our students, our teachers, and in our schools," said David Rose, deputy chief in the district's Dept. of Educational Technology and Library Programs.

In its simplest form, blended learning programs combine face-to-face instruction with personalized online learning using adaptive courseware that gives students some control over their pace and content of instruction.

D.C.'s blended learning approach grew out of a district-wide push designed to ratchet up student performance and provide a centralized way to track data from the success of some enterprising schools. That was Spring 2012.

Months of research, careful introspection, and brainstorming led to a reimagined curriculum and classroom structure, with blended learning as a central component. Administrators saw blended learning as a way to provide more personalized, self-directed learning that they could focus on the high-level cognitive skills that students need to succeed in college and beyond.

"We're not a one-to-one district," said Rose. "We started with academic goals and found the technology to help put those goals in place and to help teachers better reach their students."

How it works

When done right, blended learning tailors education to each student's needs by offering high-quality teaching with cutting-edge online learning programs. The district is using two programs, ST-Math and First in Math, for math instruction, and myON and Lexia Learning for English Language Arts and reading in most of its participating elementary schools.

"Blended learning frees up time for project-based learning, higher-order thinking teaching and learning, and Socratic discussions," said Michael Horn, co-founder and executive director at the Clayton Christensen Institute for Disruptive Innovation. "Teacher time is now freed up to look at other aspects of teaching."

Rose points out that the district incorporated many changes to ensure that it could meet Chancellor Kaya Henderson's five goals as part of her strategic plan to improve D.C. schools. In addition to blended learning, the district renovated and modernized many of its schools to include new infrastructure and wiring, built a few new school buildings, and revamped or refreshed much of its technology.

To get the initiative off the ground, several grants have provided DCPS schools necessary funding, such as a $1 million donation from Microsoft in 2013 to help D.C. teachers redesign classrooms using blended learning and a $2 million Breakthrough Schools grant competition, also in 2013, which awarded six $100,000 planning grants to selected schools. The grant competition was funded in part by the local D.C. CityBridge Foundation, which also funds teaching fellowships.

Randle Heights Elementary School received a $250,000 grant from the Dell Foundation to use explicitly for blended learning. Students spend 10 minutes in whole group discussion and then three 35-minute sessions in small groups either with their teacher, reviewing digital content, or doing individual work at learning centers or on projects. They go through this rotation twice a day, even in kindergarten.

In several district schools, where many students are or have been below grade-level, the computer programs help give teachers and students real-time data to monitor academic progress. It has been especially empowering for the students as they now get to see their progress, understand where they are strong and weak, focus on areas to improve, and feel a sense of accomplishment when they excel.

"It's almost like personalized learning because every student's dashboard looks different based on their learning

Who's using blended learning?

The extent of blending learning nationwide is not clear. The U.S. Dept. of Education doesn't track blended learning in its research. However, according to "Keeping Pace," an annual report by the Evergreen Education Group in Colorado that examines online and blended learning, in 2012 an estimated two-thirds of the nation's nearly 14,000 school districts offered some sort of blended learning option.

Chicago and Detroit are among them, along with dozens of charter schools and small and rural districts. In fact, some of the most high-profile examples of effective blended learning come from charter networks, such as Rocketship Education, Aspire Schools, and Carpe Diem Learning Systems.

ability and pace," said Randle Heights Principal Tracy Foster.

For DCPS, it didn't all happen at once. Across the district, blended learning was rolled out slowly, starting with the most eager teachers, but it caught on as word spread about its success. For some teachers, the move to blended learning has transformed their teaching. Valyncia Hawkins is one of them.

Teaching transformed

Hawkins, a fifth-grade teacher at Anne Beers Elementary School in southeast D.C., is a 20-year veteran with D.C. schools. She's also a teaching fellow with the local CityBridge Foundation, which launched a training fellowship program for district teachers to introduce them to innovative ways schools across the U.S. are using technology and blended learning.

"Four years ago, I had no idea" of blended learning, said Hawkins. "But now it's given me new life as a teacher."

Hawkins has redesigned her approach to teaching math, having students rotate through stations and spending part of their time learning online and the other part working with her in small groups. She also has designed a summer math program and a website with "playlists" of different activities and assignments students can do on their own and in groups.

"The more I know about blended learning and how to use it, the more I realize I need to learn, but I would rather have it that way," said Hawkins.

Getting results

While it will be months, or even years, before DCPS schools can point to the long-term effects of using blended learning, administrators here are confident that the program is helping students excel. From 2012 to 2014, Ketcham Elementary School, in southeast D.C., saw an 11-point increase in its math proficiency rate and a 4.5-point increase in reading. And, in a three-year period, Stanton Elementary School, also in southeast D.C., doubled its percentage of students proficient in reading while tripling its percentage of students proficient in math.

The district's goal is to develop a blended learning feeder pattern so students have continued exposure to blended learning throughout their academic careers. Currently, students at Randle Highlands and Ketcham will use some form of blended learning throughout their years in the district, since they are the feeder schools to Kramer Middle School and Anacostia High School, both of which have blended-learning programs.

"We've seen a real culture shift here, and I suspect that we'll see continued changes and a lot of success as we build up our blended learning program and the content for the students," Rose said. "It's a strong move forward." eSN

Lucille Renwick is a contributing writer for eSchool News.

Simple microcontroller programming for novice makers

New tools are taking the tedium out of programming microcontrollers


Trevor Shaw

When I designed the curriculum for my middle school Physical Computing course, I envisioned microcontroller programming as the pinnacle of student progress in the course. A microcontroller is essentially a tiny computer on a circuit board. They usually retail for under $50, and they allow students to connect sensors, motors, LEDs, and other electronics connected to IO pins by writing code and uploading their code to the board. Arduinos, Humming Birds, and Raspberry Pis are examples of popular microcontrollers.

I felt that if I could get my students to the point where they could read sensor input from the physical world, process that data on an Arduino board, and execute instructions based on it, they would have developed a great understanding of the fundamentals of the course. I felt that these skills would transfer to nearly any electronics task, and with additional research, my students would be able to invent and build nearly anything they wanted to.

The problem is that microcontroller programming is complicated. Also, unlike the video game controllers or battery-powered cars that students were building earlier in the course, the concept of what an Arduino board is, what it does, and why they should care, is completely foreign to most students.

In order to get students to succeed at this daunting task, I needed to give them an experience where they could see an authentic need for a microcontroller. I then needed to scaffold things like circuit construction and programming for them, so they could develop those skills in a way that was engaging and not frustrating.

In my last column, I explained how littleBits, a collection of electronic components that snap together magnetically, scaffold sophisticated electronics concepts for students who are then able to create useful and meaningful circuits and tools. I was thrilled a couple of weeks ago, when one of my students was creating a basketball game in Little Bits, and he ran into a brick wall. He wanted to detect when a ball went through a hoop using a sensor and change the value displayed on the Number bit, which is a digital, seven-segment display. The problem is that the number displayed on this bit is determined by the voltage in the circuit. The only way to change the number is to manipulate the voltage. Furthermore, he needed the number to increase each time a basket was scored, so he needed his circuit to "remember" what the previous voltage was and increase it based on that value. To do this, he needed a microcontroller.

Thus, littleBits created the opportunity for my student to see first-hand why a microcontroller is important to him and what it is capable of doing. Fortunately, littleBits also sells an Aruduino bit that can magnetically click into place between the sensor on the hoop and the number bit. This bit replaces the traditional rows of header pins with three littleBit magnetic input connections on the left and three output ports on the right.

This is huge. It means that the student who needs to control his or her circuit programmatically is now able to do so without having to strip wires, connect components on breadboards, or deal with the complexity of a circuit design.

Of course, circuit design is only one of several challenges for students programming a microcontroller. Students who are novice programmers will also struggle to write the actual code. For several years, graphics-based programming tools like Scratch or Tynker have helped students learn programming fundamentals without having to struggle with the tedium of code writing. Arduinos, however, are programmed in a proprietary language that is based on Processing. This can be daunting for students.

Fortunately, a Spanish company called Citilab has developed a Scratch derivative that can be used to program an Arduino. Technically, S4A (Scratch for Arduino) code executes on a connected computer, not directly on the Arduino. It works by reading and writing to Arduino pins every 75ms, so this limits invention to those that can be tethered to a nearby computer. But this may be a great way to introduce beginner programmers to writing code for a microcontroller.

The Arduino bit addition to the littleBits library has effectively put microcontroller programming into the hands of young students regardless of their experience level. By eliminating the tedium of circuit building and breadboarding, the Arduino Bit leverages the power of the sophisticated but simple click-and-build system of littleBit circuit design. By combining this bit with a graphics-based programming environment such as Scratch, novice makers will have an entry point into microcontroller programming.

Ultimately, they can progress to more traditional Arduino boards with circuits they build on breadboards. When this happens, they will be limited only by their imagination. eSN

Trevor Shaw is currently the director of technology at the Dwight-Englewood School and can be reached at @shawt, +TrevorShaw, and shawt@d-e.org.

How the digital age is enabling new pedagogies

Michael Fullen, one of the world's leading education thought leaders, has a compelling message about why we need new pedagogies and how technology is at the core of making that happen. *In A Rich Seam: How New Technologies Find Deep Learning*, he writes, "The combination of the 'push' of traditional schooling that fails to keep students or teachers engaged, and the 'pull' of new pedagogies unleashed through digital access" is making the transformation of education systems on a broad scale not only possible, but also inevitable.

Keith Krueger

Hopefully, I now have your attention.

Dr. Fullen comes to this view with an interesting history. In *Stratosphere*, published in 2012, he made the case that whole system reform requires right and wrong drivers, and that technology was typically a wrong driver.

So what changed?

Clearly, the digital revolution is occurring all around us—in the workplace, at home, and in our daily lives. The revolution is transforming the way children and young people play, access information, and communicate with each other outside of school. But, so far, this revolution has not transformed most schools in the ways educators teach and students learn in classrooms.

On a recent CoSN webinar, I pressed Dr. Fullen to explain his new optimism on why he believes the digital age is at the core of reimagining learning. He responded that there are both "push" and "pull" factors that undergird his argument. On the push side, our traditional schools are increasingly boring and irrelevant to both students and teachers. To illustrate this point in a dramatic way, Fig. 1 signifies the loss of enthusiasm by grade level. While students start kindergarten loving school, it undergoes a steep decline as they spend time in middle and high school.

Conversely, on the "pull" side of the equation, there are exciting opportunities that are possible with digital learning. Fullen describes how some school systems are leveraging these opportunities to create "new pedagogies."

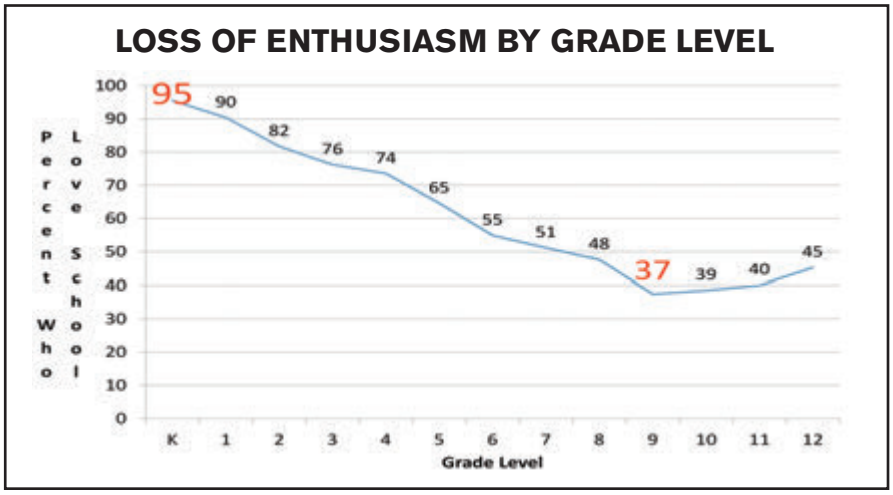
Or, in his words, "The 'new pedagogies' are not just instructional strategies. They are powerful models of teaching and learning, enabled and accelerated by increasingly pervasive digital tools and resources, taking hold within learning environments that measure and support deep learning at all levels of the education system. 'Deep learning,' in the way we will describe it, develops the learning, creating, and 'doing' dispositions that young people need to thrive now and in their futures."

Fullen also makes the case for a new change leadership that merges top-down, bottom-up, and sideways energies to generate change that is faster and easier than anything seen in past efforts at reform.

Finally, Fullen argues that new economics make the powerful learning tools that accelerate the push/pull and new change leadership forces more affordable for all. These forces are nascent, but we see them expanding rapidly—together acting as a form of positive contagion that becomes unstoppable given the right conditions.

Perhaps most exciting, Fullen believes that 2015 is the year of action. By that, he means that now is the moment for education leaders to make the digital leap and make possible these new pedagogies. We no longer should think about digital strategies for "lighthouse,' technology-rich schools, but rather as the heart of whole system reform and available to all students. eSN

Keith Krueger is CEO of the Consortium for School Networking.



Fullen's "The Unplanned Digital Revolution"

What does this new learning look like?

Michael Fullen believes that new pedagogies must be exciting, innovative learning experiences for all students:

- Irresistibly engaging for both students and teachers
- Elegantly efficient and easy to use
- Technologically ubiquitous 24/7
- Steeped in real-life problem solving

Data

continued from page 1

domain on the site. Stifling a yawn or two, I started to do what any bored student would do—see if I could break stuff.

Eventually, I happened upon an exploit by chance. I was working both in my district's instance (the domain and accounts registered for our schools) as well as the one the county office set up for this presentation. Sometimes when I signed out of one, it signed me out of the other as well. I signed into my district as the top level admin, and then redirected to the county site by simply changing the URL. In doing so I gained top-level privileges to the county's instance, too, which should have been reserved exclusively for the vendor reps making the presentation. I raised my hand and asked, "Do you know someone can gain higher privileges than they should have?"

In response I was told, "That's not possible."

So, I deleted part of the presentation content I shouldn't have had access to. Now I had their attention. The reps said they'd pass my report of the vulnerability along to the development team. I tend not to make too many friends at these meetings.

What you can do

While you can take steps to secure your own resources, the data you send to online partners is dependent on those companies following best practices as well. The first thing to think about is what data is being sent to your partners. An example might be using an ID that is not confidential. Every site needs a unique ID for each student, and some will ask for the Statewide Student ID, but in many cases other, less-sensitive data can be used. Another consideration is how the services acquire student information. Creating an exemption in the firewall to make a connection, sending information over unencrypted connections (like email), or making a direct connection to the student information or the directory server are all practices that significantly increase your exposure to security breaches.

The last consideration is to check if your online partner has made the appropriate preparations themselves. Here are some questions to ask that will help in determining if they have the right precautions in mind: How do you monitor for data breaches? What is your protocol and notification policy after finding there was a breach? What backup and disaster recovery methods do you have in place?

If you're doing everything you can do, the remainder of the responsibility is on them. A responsible partner will have answers ready for these questions and will take your concerns seriously. If the response is "That's not possible," it may be time to leave your partner—and their vulnerabilities—behind. eSN

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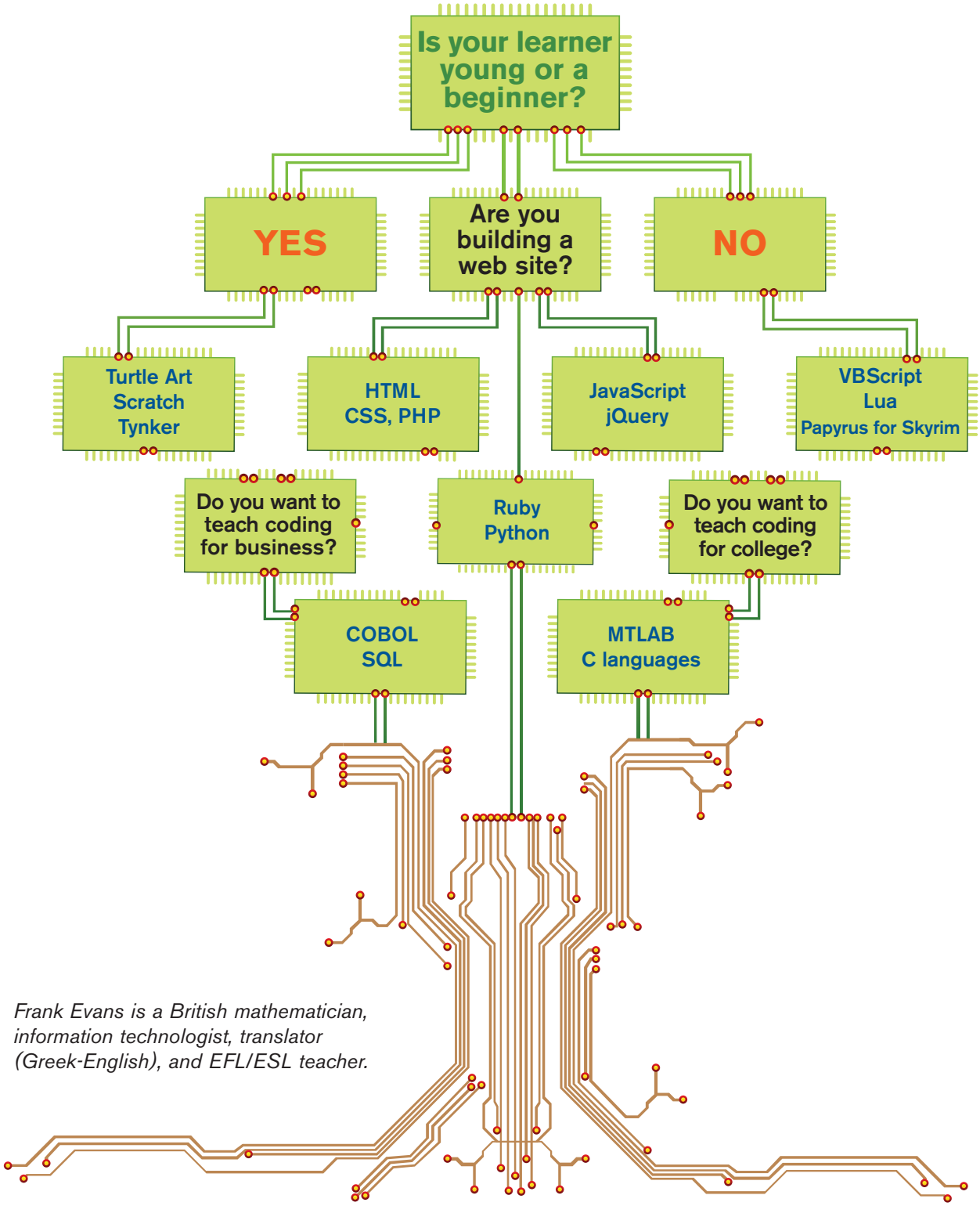

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